

# Ultra-short pulse XUV emission from atoms in intense laser fields

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**Abstract:** In high intensity laser pulses with halfwidths on the order of ten optical cycles ( $\sim 20$  fs), neutral atoms will survive to such high field strengths that complete ionization is achieved during the rising edge of the pulse within a few optical cycles. This leads to some observable changes in the properties of the photo-emission spectra. Harmonic wavelengths can be shifted and their strengths and the maximum energy allowed are also affected. The highest members of the harmonic plateau develop a linear chirp which can be removed using a grating pair to yield coherent XUV pulses on the order of 1-2 fs in length [1]. The dynamics of ionization and the effects on the emission processes in such ultra-short pulses will be described.

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1. K. J. Schafer, K. C. Kulander, J. A. Squier and C. P. J. Barty, in *Generation amplification and measurement of ultrashort pulses III*, W. E. White and D. Reitze, Eds., Proc. SPIE **2701** (1996), in press.